CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS AND UTILITIES
COMBINED SEWER OVERFLOW ANNUAL REPORT FOR 2021

NPDES PERMIT #WA-002928-9

SUBMITTED TO WASHINGTON DEPARTMENT OF ECOLOGY

May 30, 2022

EXECUTIVE SUMMARY

In 2021, the City of Bremerton (City) continued to improve and update its wastewater collection system. All of the Combined Sewer Overflow (CSO) projects were completed by the end of 2009. The **16-year, $50+ million-dollar CSO Reduction Program** achieved greater than 99% reduction in the frequency and volume of CSOs. Bremerton joins only three other Washington State communities in celebrating completion of all its planned CSO Reduction projects.

This milestone was achieved by completing all stormwater separation, sanitary sewer system upgrades, operational changes, and private property stormwater separation projects identified in the CSO Reduction Plans.

Chapter 173-245-090 of the Washington Administrative Code (WAC) requires submittal of an annual CSO report by May 31. The following information is included in this Annual CSO Report:

- CSO Event, Duration, Volume, Precipitation, Storm Duration
- CSO Event Volume and Frequency monitored in 2021
- Summary of CSO Reduction projects completed to meet federal and state requirements
- Eastside Plant yearly averages of TSS removal efficiency and effluent settleable solids

In 2021 the City of Bremerton:

- Is in compliance with CSO reduction requirements at all 15 sites
- Reduced overflow volume by greater than 99%
- Reduced frequency of events by greater than 99%
- Continued its public education and assistance program to involve citizens of Bremerton with CSO Reduction and provided education on water pollution prevention

The following charts illustrate the percent reduction of frequency and overflow volume as a result of CSO improvements by comparing the baseline frequency and volume with recorded CSO data. CSO frequency and volume baselines were calculated in 1996 using several years of monthly CSO data as measured at each CSO site. Baselines are used to monitor the progress and effectiveness of Bremerton's CSO reduction program. Percent reduction from baseline is calculated by comparing the CSO frequency and volume baselines with 2021's annual CSO event count and volume measured for all events.

1) Introduction

In 2021, the City of Bremerton continued to improve and update its wastewater collection system. All CSO projects were completed by the end of 2009. The **19-year, $50+ million-dollar CSO Reduction Program** achieved greater than 99% reduction in the frequency and volume of CSOs. Compliance with Chapter 173-245 WAC has been accomplished for all CSO sites.

This was achieved by completing all stormwater separation, sanitary sewer system upgrades, operational changes, and private property stormwater separation projects identified in the CSO Reduction Plans.

WAC 173-245-090 requires submittal of an annual CSO report by May 31 of the following year. The following information is included in this Annual CSO Report:

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In 2021, the City of Bremerton's wastewater collection system contained 15[1] CSO sites. These structures are in the older portion of the City's wastewater collection system and some pre-date the first wastewater treatment plant built in 1946. CSO site locations are shown in **Figure 1**. All sites have outfall numbers assigned in the City's wastewater treatment plant (WWTP) National Pollutant Discharge Elimination System (NPDES) permit.

Although the City has continually improved the wastewater collection system, a focus on CSO reduction planning began in 1989 in response to Department of Ecology (Ecology) regulations to limit CSOs into state waters. Ecology approved Bremerton's first CSO Reduction Plan in November 1992. A CSO Plan Update was completed in 2000 detailing recommended improvements for the City's wastewater collection system to reduce CSOs implemented through 2009. Ranking of improvement projects considered public health, cost effectiveness, safety concerns, overflow frequency, and infrastructure conditions. All proposed CSO reduction projects are identified in the City's CSO Reduction Plan Update and associated facility plans for wastewater collection system drainage basins.

Ecology issued an Order on Consent to the City in 1993 formalizing the schedule set forth in the City's CSO Reduction Plan. Also in 1993, the City settled a citizen's lawsuit with the Puget Soundkeeper Alliance (PSA), resulting in an agreement that included additional requirements such as CSO water quality monitoring and an accelerated construction schedule. CSO baselines and the implementation schedule were modified in an amended order in 2000.

[1] OF 12, in Anderson Cove basin, is included as one of the 15 CSO sites but was taken out of service when CW-4 was upgraded in 2020. Ecology is waiting for documentation from the City prior removing this outfall from the CSO site list.

LIST OF CITY OF BREMERTON CSO OUTFALLS PER SECTION S.9 OF NPDES PERMIT NO. WA0029289			
OUTFALL NUMBER	**BASIN**	**LOCATION**	**RECEIVING WATER**
OF-1	Pine Road Basin	47.581490 -122.636958	Port Washington Narrows
OF-2	Stevens Canyon Basin	47.580579 -122.635489	Port Washington Narrows
OF-3	Cherry Avenue Basin	47.578031 -122.625189	Port Washington Narrows
OF-4	Eastpark Basin	47.571662 -122.619867	Port Washington Narrows
OF-6	Tracyton Beach Basin	47.585558 -122.646475	Port Washington Narrows
OF-7A	Trenton Avenue Basin	47.568998 -122.606821	Port Washington Narrows
OF-7B	Trenton Avenue Basin	47.568998 -122.606821	Port Washington Narrows
OF-8	Anderson Cove Basin	47.584747 -122.650852	Port Washington Narrows
OF-9	Anderson Cove Basin	47.580463 -122.645788	Port Washington Narrows
OF-10	Anderson Cove Basin	47.578889 -122.640556	Port Washington Narrows
OF-11	Anderson Cove Basin	47.578889 -122.639444	Port Washington Narrows
OF-12	Anderson Cove Basin	47.578611 -122.636389	Port Washington Narrows
OF-13	Warren Avenue Basin	47.578205 -122.630167	Port Washington Narrows
OF-16	Pacific Avenue Basin	47.561667 -122.625278	Sinclair Inlet
OF-17	Callow Avenue Basin	47.554167 -122.651111	Sinclair Inlet

2) CSO Water Quality Impact Model

A CSO/Fecal fate and transport water quality model was developed by the US Navy and USGS as part of the US Navy's ENVVEST Program. The calibrated model indicates Bremerton's CSOs have no measurable effect on bacterial quality of the receiving waters in Sinclair and Dyes Inlets. The model provided the Washington State Department of Health with enough information to re-open shellfish beds in Dyes Inlet in 2003 for the first time since they were closed in the late 1960's.

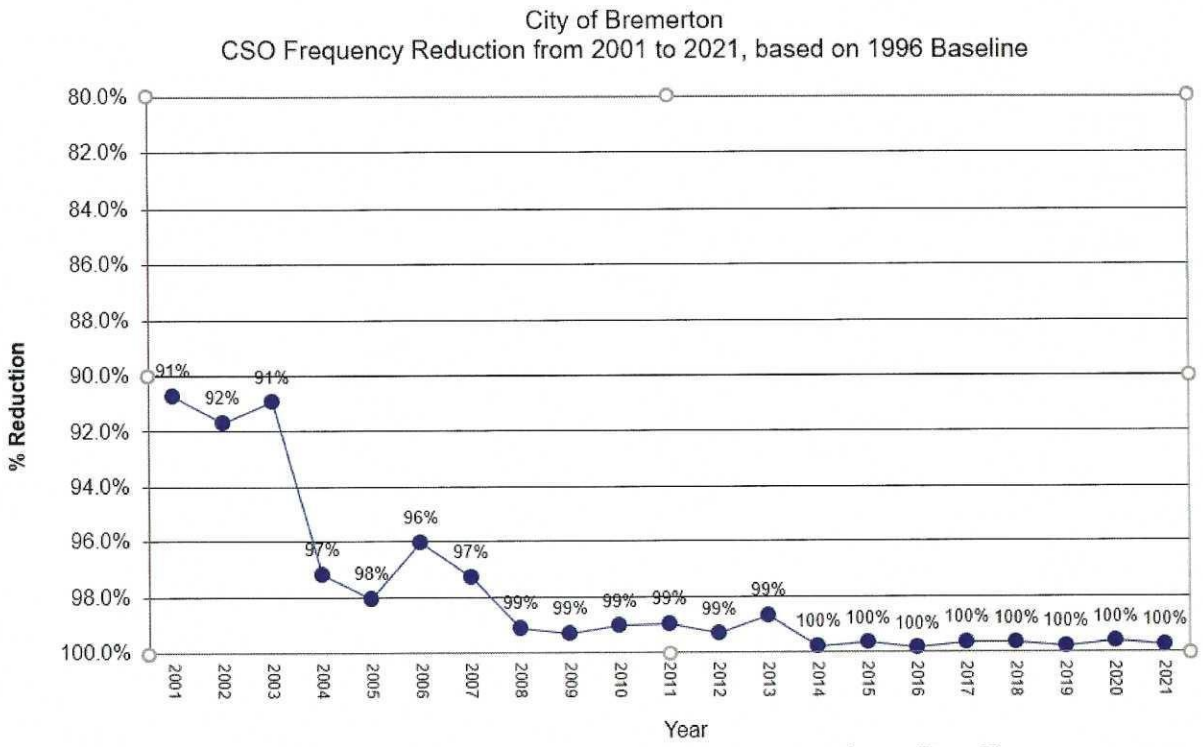

Figure 2 - Percent Reduction of CSO Frequency from Baseline

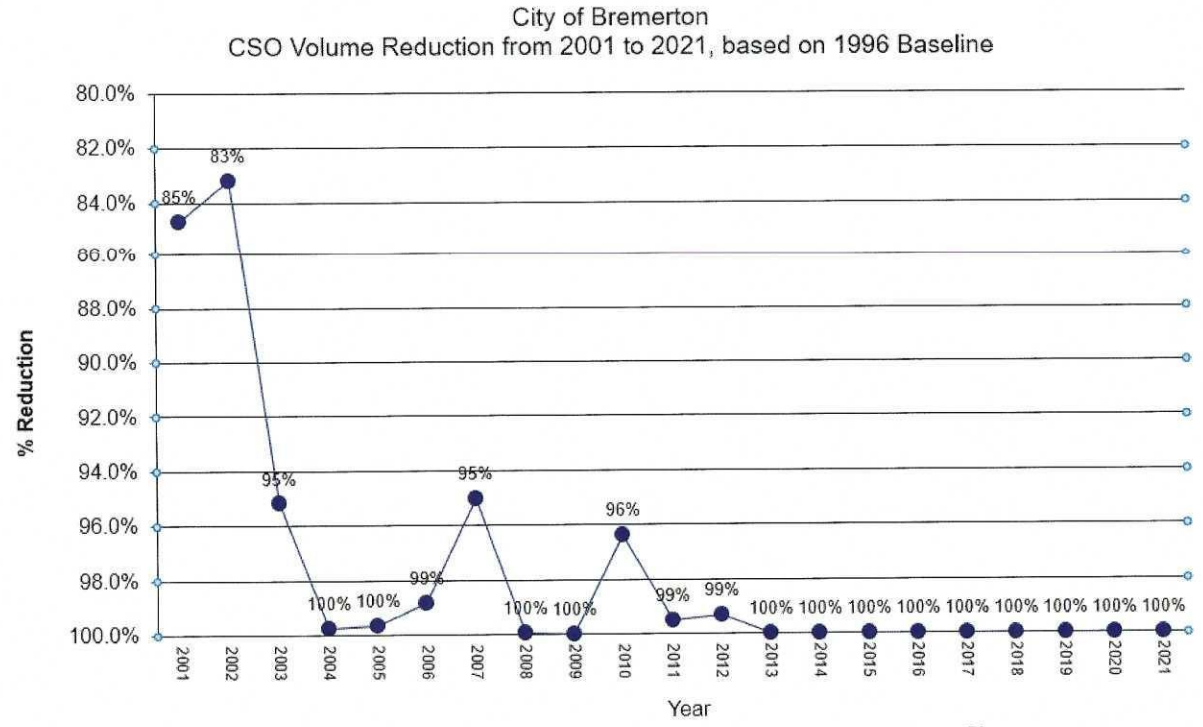

Figure 3 - Percent Reduction of CSO Volume from Baseline

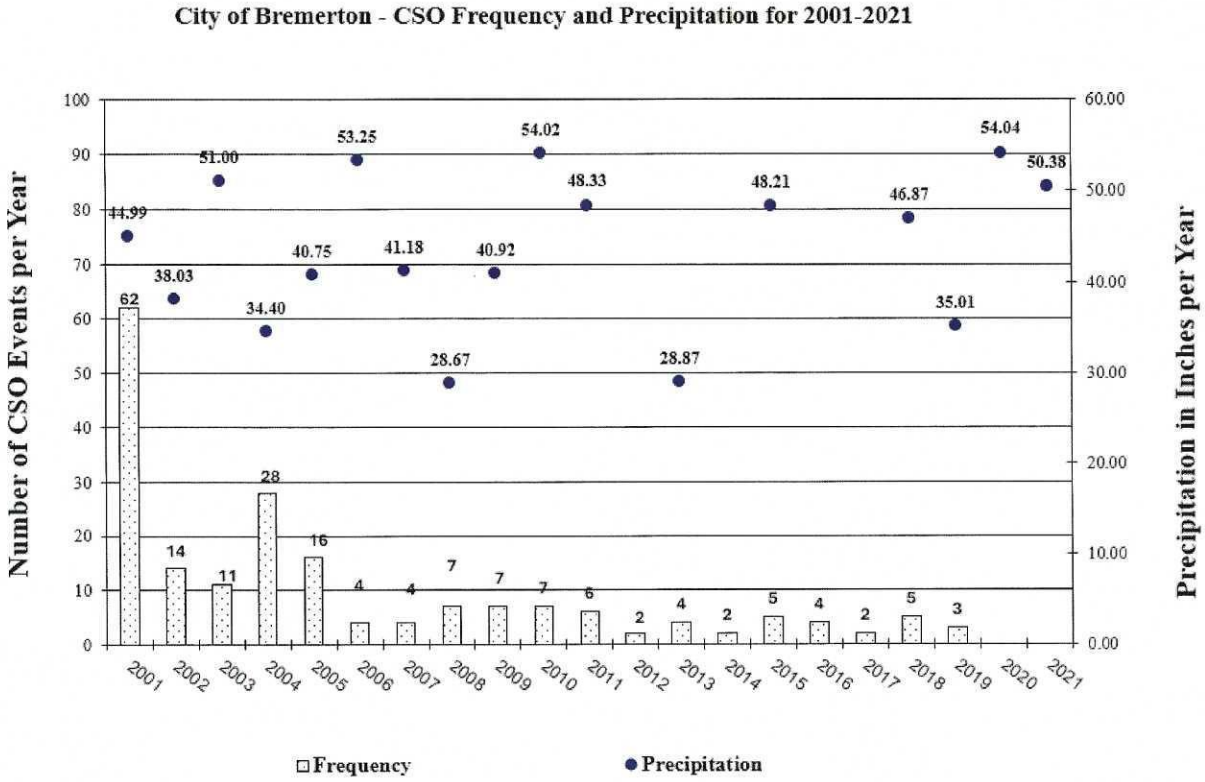

Figure 5 - CSO Frequency and Precipitation for 2001-2021

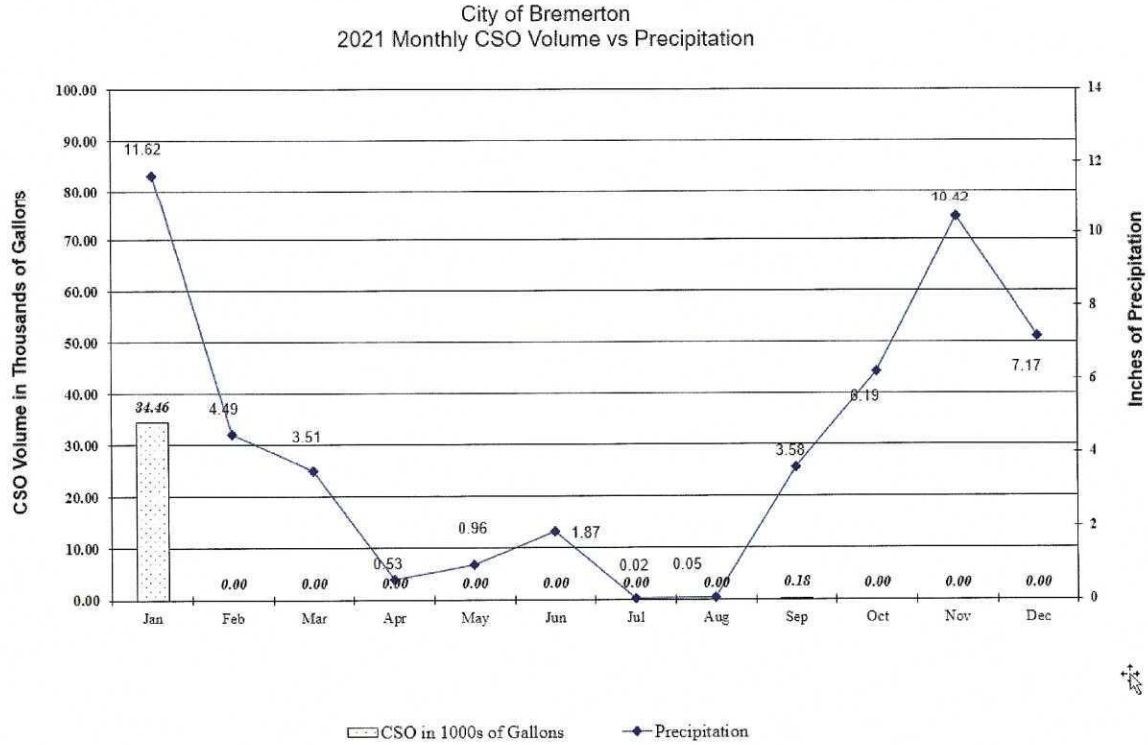

Figure 6 - Monthly Overflow Volume vs. Precipitation for 2021

CSO REDUCTION COMPLIANCE REPORTING TABLE

CSO Site	Completion yr	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	CSO events 20yr AVG
OF1	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0.10
OF2	2002	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05
OF3	2005	0	1	0	0	0	1	1	0	0	0	1	3	1	0	0	1	1	0	0	0	0.50
OF4	2003	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.10
OF6	2005	1	1	1	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0.40
OF7A	2004	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.10
OF7B	2004	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.25
OF8	1999	1	0	0	0	2	1	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0.40
OF9	2008	1	1	1	0	0	1	0	0	1	1	1	0	0	0	0	0	1	1	1	1	0.55
OF10	2008	1	1	1	1	1	1	1	1	1	1	1	2	0	0	0	0	1	0	2	0	0.80
OF11	2008	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	3	0	1	0	0	1.05
OF12	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
OF13	2002	0	0	1	1	0	1	1	1	1	0	1	0	0	1	0	1	0	0	0	0	0.45
OF16	2009	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.30
OF17	2003	1	1	0	1	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	2	0.45

Following is a summary of compliance activity at CSO sites

Pine Road Basin

OF 1 was completed in 2000 with the construction of in line storage and separation projects.

Stevens Canyon Basin

OF 2, with separation, in-line storage and the East Side Wet Weather Treatment Facility completion in 2002.

Cherry Avenue Basin

OF 3 is influenced by flows that come from OF7A and 7B and a restriction in the beach main just downstream from the OF site. The Cherry Avenue CSO reduction improvements included replacement of a portion of the gravity pressure main to eliminate a capacity bottleneck, and installation of cleaning access structures on the beach. This construction was completed in 2005.

East Park Basin

OF 4 projects included separation and flow diversions that were completed in 2003. The 18" sewer pipe from Wheaton Way was plugged in 2003, so the only flow currently going through the OF-vault is from 68 apartment units and 2 single family residence properties.

Tracyton Beach Basin

OF 6 CSO reduction improvement for the Tracyton Beach Basin included an upgrade to pump station EB-6. Construction of this project began in 2004 and was completed in February, 2005.

Trenton Avenue Basin

OF 7A and OF 7 B, CSO Reduction was completed in the Trenton Avenue Basin by upgrading two pump stations, replacing a section of the beach forcemain, along with several flow diversions and stormwater separation. All necessary project components required to increase the capacity from this basin were completed in 2004.

9) CSO Program Cost to Reduction Comparison

Figure 7 shows the impact of money spend over time. As funds increased and improvements were completed, CSO volume and frequency decreased.

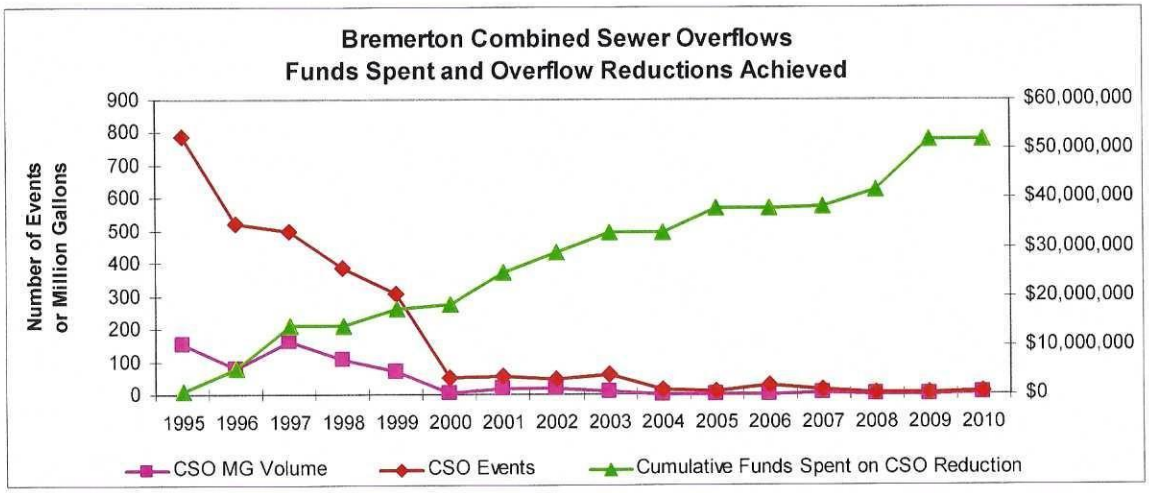

Figure 7 - Cost comparison per million gallons of CSO reduced

Bremerton achieved a 90% reduction in CSO events by 2000 at a cost of $18 Million. By 2004 a 97% reduction of CSO events was achieved for an additional $14.7 Million. The remaining $19.2 Million was spent to reduce the remaining 3% of CSO events to the regulatory limit and to build in extra system capacity to collect and treat storm events greater than the design storm.

10) Wastewater System Upgrades and Improvements

Bremerton is continually making upgrades to its collection and treatment systems to ensure ongoing CSO compliance. In 2021:

- Constructed an upland low pressure sewer system for Oyster Bay along Kitsap Way and Shorewood Drive. This project was funded by an Ecology loan for $7.7M.
- Performed cure-in-place-pipe (CIPP) of 6,500 lineal feet of sewer mains to prevent infiltration and inflow.
- Replaced 350 feet of old clay pipe sewer along 6th Street to reduce infiltration.
- City staff continues to line sewer laterals using City-owned equipment.

11) Update of Wastewater Comprehensive Plan

Bremerton's Wastewater Comprehensive Plan update was completed and adopted by the Bremerton City Council on December 17, 2016. The Plan was submitted to the Washington Department of Ecology and approved on November 14, 2016. The Plan ensures existing and future wastewater capacity and plans for wastewater system improvements.

An approach to develop multiparameter and multimedia TMDLs and assess ecological risk at the watershed scale is being conducted to develop and demonstrate alternative strategies for protecting and improving the ecological integrity of Sinclair and Dyes Inlets. The watershed-based assessment is evaluating environmental problems at the proper scale, providing an integrated framework for cooperative studies with stakeholders and partners, and developing linkages between problems and management options. The studies are providing data to address key issues identified by the working groups, improving the understanding of how the ecosystem functions, and increasing the ability to solve environmental problems. The Technical Working Groups are fostering partnering among stakeholders and establishing the technical and scientific basis to better protect and improve the health of the watershed."

Project ENVVEST developed a water quality model that defined the impacts of CSOs and other inputs on local water quality in Sinclair and Dyes Inlets. The model shows that potential impact of CSOs to shellfish beds in Dyes Inlet is minimal. **This modeling effort provided the Washington State Department of Health with information needed to reopen several shellfish beds in Dyes Inlet to harvesting in 2003.** The model was calibrated using data collected in the field, which involved a drogue study, current/flow monitoring, general water quality analysis, and a dye release study from the ESTP. The model shows that shellfish beds are not impacted during a CSO event.

14) Funding

The City has expended over $50 Million dollars to complete the CSO Reduction program over the past 19 years. Outside sources of funds were obtained wherever possible, and included the following:

- 12 Public Works Trust Fund Loans totaling $26,800,000
- 20 State Revolving Fund Loans/Centennial Clean Water Fund Loans totaling $8,300,000
- 4 State and Tribal Assistance Grants totaling $7,500,000.
- Revenue Bonds totaling $2,900,000
- Directly from Rates: $4,800,000

15) Compliance with Nine Minimum Controls

Compliance with the Nine Minimum Controls, required by the EPA CSO Policy, is determined by professional judgment of the NPDES control authority, the Department of Ecology. The City's efforts to comply with these controls are described below.

PROPER OPERATION AND MAINTENANCE

The City's WWTP has a written operations and maintenance manual and a computerized maintenance management program. Adequate funding is budgeted for these activities. An emergency response procedure is in place. The City is in compliance with the CMOM regulations.

Kitsap County has an effective pollution prevention program through the Solid Waste Division of the County Public Works Department and the Solid Waste Program at the Bremerton-Kitsap County Health District. Most residents and businesses are actively recycling. In 1996 the County opened its Moderate Risk Waste Facility to handle dangerous waste from homes and small generators. Bremerton is an active participant in the "West Sound Stormwater Outreach Group" (WSSOG), since 2001, that provides pollution prevention information through brochures, web page information, and newspaper ads. The purpose of the WSSOG is to work collaboratively to ensure compliance with the stormwater NPDES Phase II permit requirements targeting public outreach and involvement.

The WSSOG surveyed Kitsap Peninsula residents to generate a baseline of awareness and behaviors that will assist with the prioritization of outreach campaigns. The City and County both publicize hotline telephone numbers for public reporting of spills and other illicit discharges.

Bremerton maintains an internet website located at bremertonwa.gov that provides pollution prevention, CSO, and water conservation information to a wide variety of interested cities, organizations and people. In 2015 there were more than 70,000 visits from more than 25 different countries and various agencies.

PUBLIC NOTIFICATION

CSO discharge to marine waters is the main public health concern for shellfish harvesting. To meet the needs of the Washington State Department of Health & Shellfish program, a notification procedure was implemented in 2003 after several beds in Dyes Inlet were re-opened for harvesting. The Bremerton-Kitsap County Health District also posts these areas when a CSO event occurs. The City's "Cooperative Approach to CSO Reduction" program educates residents through a multi-media approach using brochures and the web site, bremertonwa.gov that explains CSO's with detailed animations.

MONITORING TO CHARACTERIZE CSO IMPACTS

CSO Water Quality Monitoring began in 1995 and ended in 2010. Samples were collected, analyzed and logged based on the water year, October to September. The City also coordinated monitoring efforts with the Navy ENVVEST project described above.

16) CSO/WW System Upgrades Planned for 2022

All capital improvements included in the CSO Reduction Plan and associated amendments have been constructed. The City continues to monitor system flows, and will consider additional system upgrades as the need arises.

Over the past several years, the City has been rehabilitated aging sewer infrastructure using cure-in-place-pipe (CIPP) technology. In 2021, the City lined approximately 6500 lineal of sanitary and storm sewer piping in order to reduce inflow and infiltration into our sewer system. Approximately 9000 feet is scheduled for lining in 2022.

19) Certification

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signed by:

Eric J. Burris, WW Manager

8-23-22
Date